

## PATENT SPECIFICATION (11)

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(19)



## (54) PLASTIC MATERIALS AND METHODS OF FABRICATING THEM

(71) We, BRICO ENGINEERING LIMITED, a British Company, of Holbrook Lane, Coventry, Warwickshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to processes for fabricating plastics materials.

According to the invention there is provided a manufacturing process comprising compacting a mixture of polytetrafluoroethylene powder and carbon powder, and subjecting the compacted mixture to microwave radiation until a cohesive product is formed. The carbon powder can be powdered graphite or coke flour.

One example of the invention will now be described. Polytetrafluoroethylene powder of 400 micron particle size was mixed with Bavarian Carbon powder of 200 micron size in a laboratory analytical mill, in the proportions of 80 per cent P.T.F.E. to 20 per cent carbon by volume. The mixture was then pressed into flat discs at room temperature at 5 tons/square inch by methods which are conventional in the P.T.F.E. processing art.

Discs were then placed in a microwave energy field of 2450 MHz frequency for 10 minutes; when examined it was found that the discs were fully sintered and had acceptable mechanical properties.

As much as 50% or as little as 1% by volume of the P.T.F.E. may be replaced by the carbon.

In the example of the invention described above it has been found that approximately 16 lbs. of the mixture per hour could be heated to sintering temperature, using a microwave power of 0.4 kw.

It has also been found possible to add a further constituent to the material, such as glass fibre and still obtain acceptable mechanical properties.

## WHAT WE CLAIM IS:—

1. A manufacturing process comprising compacting a mixture of polytetrafluoroethylene powder and carbon powder, and subjecting the compacted mixture to microwave radiation until a cohesive product is formed.

2. A process according to claim 1, where in the carbon powder is powdered graphite or coke flour.

3. A process according to either of the preceding claims wherein the mixture contains approximately 80% by volume of polytetrafluoroethylene powder and approximately 20% by volume of carbon powder.

4. A process according to claim 1 substantially as herein described with reference to the Example.

5. A cohesive product when manufactured by a process in accordance with any of the preceding claims.

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